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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,729	11/16/2005	Michael Reinstadtler	785.44774X00	8396
20457 7590 06/29/2007 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER LARKIN, DANIEL SEAN	
			ART UNIT 2856	PAPER NUMBER
			NOTIFICATION DATE 06/29/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/524,729	REINSTADTLER ET AL.	
	Examiner	Art Unit	
	Daniel S. Larkin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>16 February 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The date listed within the declaration for the filing of the German Priority document is incorrect. The declaration states that the German Priority application was filed on 08 August 2003; however, the first page of the German Priority document lists the date of filing as 16 August 2002.

Drawings

3. The drawings are objected to because of the following:

Reference box "6", as shown in Figure 1, should also be labeled

-- signal generator -- in order to more clearly identify the structure of the invention without having to look through the specification.

Reference box "10", as shown in Figure 1, should also be labeled

-- back-coupling loop --.

Art Unit: 2856

Reference box "11", as shown in Figure 1, should also be labeled

-- processing unit --.

Reference box "12", as shown in Figure 1, should also be labeled

-- computing unit --.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "wideband amplifier and the spectral analyzer", as recited in claims 14 and 15 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

Art Unit: 2856

examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

Page 3, line 9: A -- comma -- should be inserted after the term "Thus".

Page 4, line 11: A -- comma -- should be inserted after the term "Thus".

Page 5, lines 3-6: This sentence should be deleted since reference to specific claim numbers should not be used since claim numbers and their associated text have a way of changing during the prosecution and examination of an application.

Page 6, line 3: A -- comma -- should be inserted after the term "example".

Page 6, line 26: The term -- continuous -- has been misspelled.

Page 7, line 5: A -- comma -- should be inserted prior to the term "such".

Page 7, line 23: The conjunction -- and -- should be inserted after the term "standstill".

Page 10, line 25: What is a "honey layer"? Is this supposed to read -- honeycomb -- layer? Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2856

8. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, claim lines 24 and 25: The phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Re claim 3, claim lines 2 and 3: The phrase "such as" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Re claim 9, claim line 3: The phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Re claim 10, claim line 4: The phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Re claim 11, claim lines 4-6: The phrase "such as" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by "Quantitative Determination of Contact Stiffness Using Atomic Force Acoustic Microscopy" (Rabe et al.).

With respect to the limitations of claim 1-13, Rabe et al. disclose an atomic force microscope having a cantilever and tip; driver means; a sensor unit; and a ultrasound generator which initiates vibration excitation between the sample and the cantilever. Arnold et al. further disclose that the vibration excitation occurs such that oscillations executed by the tip have higher harmonic vibration parts relative to the excitation frequency; and that the excitation is conducted at amplitudes that lead to torsional amplitudes and resonance spectra is used to examine the sample surface, see Figures 1, 4, and sections 2 and 3.

11. Claims 1-13 are rejected under 35 U.S.C. 102(a) as being anticipated by "Atomic Force Microscopy at Ultrasonic Frequencies" (Arnold et al.).

With respect to the limitations of claim 1-13, Arnold et al. disclose an atomic force microscope having a cantilever and tip; driver means; a sensor unit; and a ultrasound generator which initiates vibration excitation between the sample and the cantilever. Arnold et al. further disclose that the vibration excitation occurs such that oscillations executed by the tip have higher harmonic vibration parts relative to the excitation frequency; and that the excitation is conducted at amplitudes that lead to torsional amplitudes and resonance spectra is used to examine the sample surface. See paragraphs 3.1, 3.2, 5.1, 5.2, 6.1-6.3.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Quantitative Determination of Contact Stiffness Using Atomic Force Acoustic Microscopy" (Rabe et al.).

Rabe et al. disclose using a lock-in amplifier, which is functionally equivalent to a wideband amplifier; however, Rabe et al. fail to utilize spectral analysis to examine torsional vibrations.

Krotil et al. ('114) disclose a method for determining friction and other material properties of a sample surface by imparting torsion to a cantilever and examining the

Art Unit: 2856

vibrations using a lock-in amplifier and Fourier transformation to determine the friction amplitude and phase of a measuring signal. Using spectral analysis to evaluate torsional vibrations would have been obvious to one of ordinary skill in the art because spectral analysis is very well known and one of ordinary skill in the art would utilize the specific techniques which is most appropriate for the evaluation.

14. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Atomic Force Microscopy at Ultrasonic Frequencies" (Arnold et al.) in view of DE 19900114 (Krotil et al.).

Arnold et al. disclose using a lock-in amplifier, which is functionally equivalent to a wideband amplifier; however, Arnold et al. fail to utilize spectral analysis to examine torsional vibrations.

Krotil et al. ('114) disclose a method for determining friction and other material properties of a sample surface by imparting torsion to a cantilever and examining the vibrations using a lock-in amplifier and Fourier transformation to determine the friction amplitude and phase of a measuring signal. Using spectral analysis to evaluate torsional vibrations would have been obvious to one of ordinary skill in the art because spectral analysis is very well known and one of ordinary skill in the art would utilize the specific techniques which is most appropriate for the evaluation.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art to US 5,852,233 (Arnold et al.) disclose an acoustic microscope allowing topography and elasticity of a sample to be measured simultaneously.

The prior art to US 6,880,386 (Krotil et al.) discloses a method for determining friction and other material properties of a sample surface by imparting torsion to a cantilever.

The prior art to "Evaluation of the Contact Resonance Frequencies in Atomic Force Microscopy as a Method for Surface Characterisation (Invited)" (Rabe et al.) disclose the combination of ultrasonics with atomic force microscopy which opens the high lateral resolution of scanning probe techniques in the nanometer range to ultrasonics.

The prior art to "Probing Linear and Non-linear Tip-Sample Interaction Forces by Atomic Force Acoustic Microscopy", Surface and Interface Analysis" (Rabe et al.) disclose measuring the flexural resonance frequencies of a free cantilever or when the tip is in contact with a sample surface.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Larkin whose telephone number is 571-272-2198. The examiner can normally be reached on 8:00 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel Larkin
AU 2856
20 June 2007


DANIEL S. LARKIN
PRIMARY EXAMINER